

THE PROBLEM OF SPECIFIC AND SUBSPECIFIC STATUS AND MORPHOLOGIC DEVIATION IN THE ANCIENT MURRELET *SYNTHLIBORHAMPHUS ANTIQUUS* (GMELIN)¹

FRED H. GLENNY

Department of Zoology and Entomology, The Ohio State University, Columbus 10

The characteristics which are used to designate a species or subspecies and the limits of structure and coloration which may be reasonably employed are points of concern to the taxonomist, systematic zoologist, and geneticist.

It has long been the practice among systematists to accord at least subspecific or variety rank to different color or even geographic variants. In the laboratory, these variants from the normal color are frequently referred to as strains—largely because their antecedents are known. This frequently is not the case with wild species. As a result, not infrequently minor differences in hair or feather coloration have resulted in separation of a species into two or more subspecies. Such differences have value largely in allocating forms to various regions or areas, or as in some instances to special ecological niches, but do not indicate important structural changes in the organism. Furthermore, individuals which are located near the periphery of their distribution, and adjacent to other subspecies of the same organism, may be indistinct from the peripheral population of the adjacent subspecies, with resultant difficulty of determining the different intergrades. Even morphologic characteristics which are reasonably constant in individuals at or near the center of a subspecies population do not necessarily hold for forms throughout the range of distribution—this may be due to variation within a community over a prolonged period of time. This tends to create difficulties in making discrete subspecific determinations.

On the other hand, when a structural difference, within an otherwise established species, does occur and in sufficient numbers to become established in a population, then should this distinctly different morphologic type not be recognized and accorded subspecific rank in the same way as are differences in hair and feather color or pattern? While it is true that skins constitute reasonably good reference materials for subsequent study, anatomical materials can also be preserved for reference or later study. In any event, a constant morphologic characteristic is still an important factor in species evolution and designation just as are colors and patterns of feathers and hair.

In a recent study of alcohol-preserved specimens (U. S. National Museum) of *Synthliborhamphus*, *S. wumizusume* (Temminck) was found to be bicarotidinae normales, but dissection of *S. antiquus* (Gmelin) revealed two morphologic types. Two specimens of *S. antiquus* were bicarotidinae normales (fig. 1), while five specimens were laevocarotidinae (fig. 2). The normally expected arrangement-pattern for the Alcidae is bicarotidinae normales as in the other Charadriiformes (Glenny, 1947, 1948). As a result, the laevo-carotidinae condition is an important deviate from the normal ordinal pattern.

Reference to collecting sites showed that two of the laevocarotidinae specimens came from widely separated regions (Sitka Bay and Amak Island). The rest of the specimens which were examined were collected in "Alaska," but no specific location was designated.

¹Contribution from the Ohio Cooperative Wildlife Research Unit.

Specimens of *S. wumizusume* were collected in Nagasaki Harbor, 30 May 1881. The breeding range for this species is given as the Seven Islands, Japan; and recorded from Sakhalin, Hokkaido, Hondo, Kiusiu and Korea (Peters, 1934).

In contrast, *S. antiquus* has a more extensive range, breeding on the coast of Amurland, Sakhalin, Kamchatka, Kurile, Commander and Aleutian Islands, Kodiak Island and locally south to Sangar Island in the Queen Charlotte Group; and wintering from the Commander and Aleutian Islands south to the China coast, Japan, and southern California.

In a single colony, morphologic deviation might be expected to occur from time to time, and some of these might become sufficiently well established to be recognizable as specific characteristics, but to have the same characteristic become established in a population of such extensive breeding range as *S. antiquus*, and to be able to observe the same variation in forms from widely separated areas of the range, presents something more of a problem in speciation than is presented

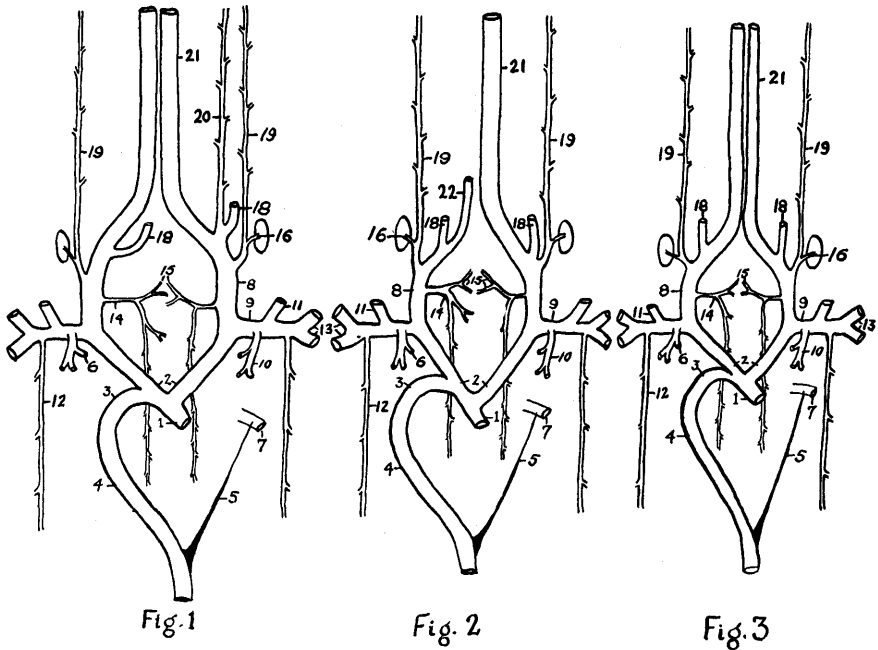


Diagram of the main arteries of the neck and thorax—ventral view.

FIGURE 1. *Synthliboramphus antiquus* B.

FIGURE 2. *Synthliboramphus antiquus* L.

FIGURE 3. *Synthliboramphus wumizusume*.

KEY TO ABBREVIATIONS

- | | |
|-------------------------------------|-------------------------------------|
| 1. aortic root | 12. intercostal artery |
| 2. innominate arteries | 13. pectoral arteries |
| 3. right systemic (4th aortic) arch | 14. ductus shawi |
| 4. right radix aortae | 15. syngo-tracheal artery |
| 5. ligamentum aortae | 16. thyroid artery |
| 6. sterno-tracheal artery | 18. vertebral artery |
| 7. pulmonary artery | 19. superficial cervical artery |
| 8. common carotid artery | 20. accessory cervical artery |
| 9. subclavian artery | 21. internal carotid (trunk) artery |
| 10. coracoid major artery | 22. accessory vertebral artery |
| 11. axillary artery | |

by chance variation within a more restricted breeding area such as might occur within a community or within a colony.

It is suggested, therefore, that these two morphologic types be temporarily designated on the basis of the presence of two carotid arteries—bicarotidinae normales—as *S. antiquus* *B* and one (left) carotid artery—laevo-carotidinae—as *S. antiquus* *L*, until such a time as other characters may be established to justify further separation of these forms.

It is suggested that additional studies of the skins of these birds, along with anatomical studies, be carried out in an effort to determine whether or not some externally visible characteristic can be utilized on which to separate these two apparent morphologic types.

The writer is convinced that internal structural differences are significant and important in the ultimate designation of specific differences and characteristics just as are externally visible characters of hair and feather coloration and design.

The writer wishes to express his gratitude to Dr. Herbert Friedmann, Curator of Birds, U. S. National Museum, for his help in making this study possible.

REFERENCES

- Glenny, F. H. 1947. A systematic study of the main arteries in the region of the heart. AVES XVI. Charadriiformes, Part 1. Ohio Jour. Sci., 47: 152-154.
———. 1948. . . . AVES XVI. Charadriiformes, Part 2. Ohio Jour. Sci., 48: 194-198.
Peters, J. L. 1934. Check-list of Birds of the World. Harvard Univ. Press, Cambridge, Mass. (Vol. II, p. 356).
-